

- 27 -

CLAIMS

1. A process for production of a supported catalyst comprising the following steps in order.

## First step

5 A step of impregnating the carrier with a solution containing (a) at least one compound which comprises at least one element selected from Group 8, 9 and 10 elements of the Periodic Table (hereinafter referred to as "(a) group compound)", to obtain an  
10 impregnated carrier (A).

## Second step

A step of contacting the impregnated carrier (A) with an alkaline substance and (b) a compound containing at least one element selected from among  
15 gallium, indium, thallium, germanium, tin, lead, phosphorus, arsenic, antimony, bismuth, sulfur, selenium, tellurium and polonium (hereinafter referred to as "(b) group compound)" to obtain an impregnated carrier (B) (where the alkaline substance and the (b) group compound  
20 may be contacted simultaneously or separately with the impregnated carrier (A)).

## Third step

A step of contacting the impregnated carrier (B) with a reducing substance to obtain a supported  
25 catalyst (C).

2. The process for production of a supported catalyst according to claim 1, which further comprises a step of loading on the carrier (c) at least one compound selected from heteropolyacids and/or their salts.

30 3. The process for production of a supported catalyst according to claim 1 or 2, which further comprises a step of contacting the carrier with (d) at least one compound selected from compounds which contain at least one element selected from Group 11 and 12  
35 elements of the Periodic Table and chromium (hereinafter referred to as "(d) group compound").

4. The process for production of a supported

catalyst according to claim 1, wherein the (a) group compound is a compound containing at least one element selected from ruthenium, osmium, rhodium, iridium, palladium and platinum.

5           5. The process for production of a supported catalyst according to claim 1, wherein the (b) group compound is a compound containing at least one element selected from gallium, germanium, tin, lead, bismuth, selenium and tellurium.

10           6. The process for production of a supported catalyst according to claim 2, wherein the polyatom of the (c) heteropolyacid and/or its salt is tungsten and/or molybdenum.

15           7. The process for production of a supported catalyst according to claim 2, wherein the heteroatom of the (c) heteropolyacid and/or its salt is at least one element selected from phosphorus, silicon and boron.

20           8. The process for production of a supported catalyst according to claim 2, wherein the (c) heteropolyacid and/or its salt is at least one compound selected from silicotungstic acid, phosphotungstic acid, silicomolybdic acid, phosphomolybdic acid and their salts.

25           9. The process for production of a supported catalyst according to claim 3, wherein the Group 11 or 12 element of the (d) group compound is an element selected from copper, silver, gold and zinc.

30           10. The process for production of a supported catalyst according to claim 1, wherein the supported catalyst is used for a reaction in which a lower aliphatic carboxylic acid is obtained from a lower olefin and oxygen.

35           11. The process for production of a supported catalyst according to claim 10, wherein the supported catalyst is used for a reaction in which acetic acid is obtained from ethylene and oxygen.

12. A supported catalyst obtained by a production

process according to claim 1.

13. A process for production of a lower aliphatic carboxylic acid, comprising using a supported catalyst according to claim 12 for a reaction in which a lower  
5 aliphatic carboxylic acid is obtained from a lower olefin and oxygen.

14. The process for production of a lower aliphatic carboxylic acid according to claim 13, wherein the reaction between the lower olefin and oxygen is carried  
10 out in a gas phase.

15. A process for production of acetic acid, comprising using a supported catalyst according to claim 12 for reaction to obtain acetic acid from ethylene and oxygen.

16. The process for production of acetic acid according to claim 15, wherein the reaction between ethylene and oxygen is carried out in a gas phase.